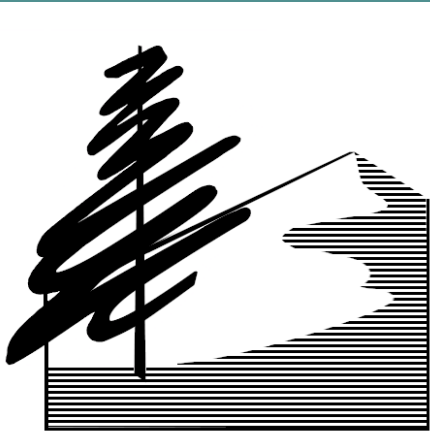



# Summary of Biological Monitoring Activities in the City of Carlsbad




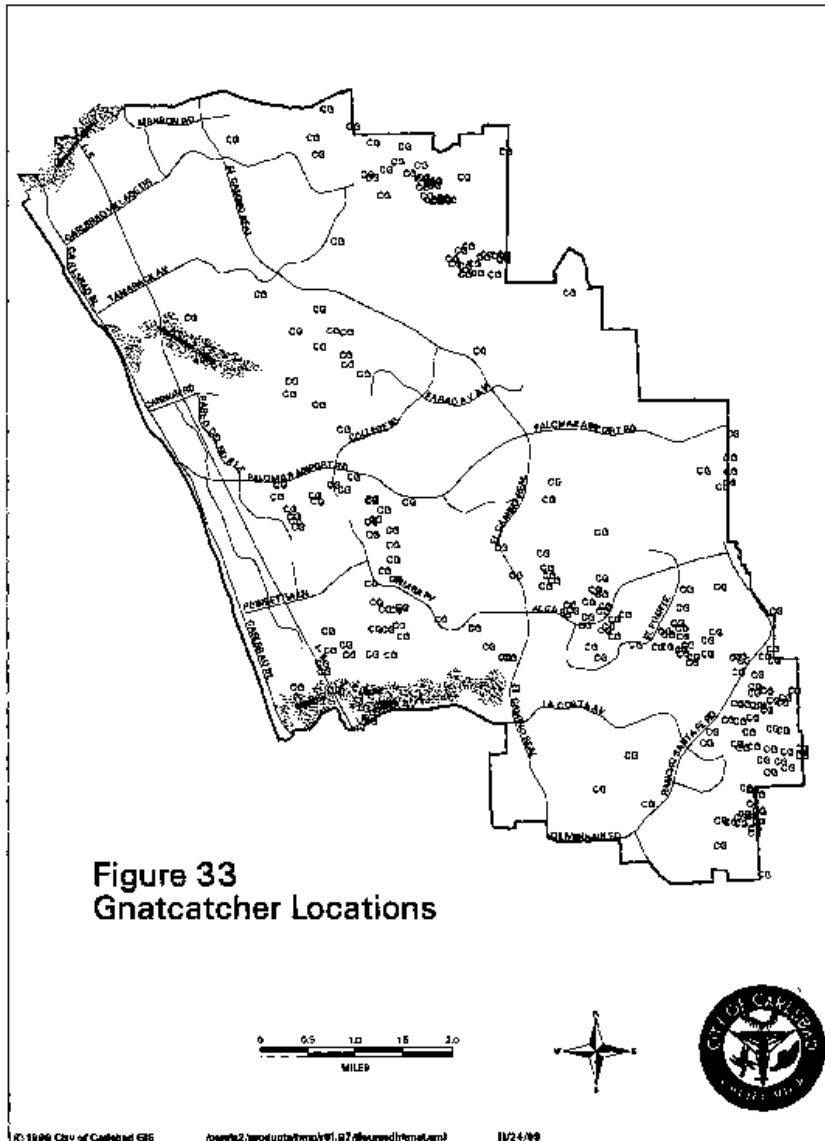
The Center for Natural Lands Management

# Activities

- ◆ Coastal California gnatcatcher surveys 2007-2009.
  - ◆ Least Bell's vireo surveys.
  - ◆ Thread-leaved brodiaea surveys and studies.
  - ◆ Fusilade experiment in east County.
  - ◆ San Diego thornmint surveys and update.
  - ◆ Orcutt's hazardia update
  - ◆ CSS habitat evaluation study.
- 
- A stylized, dark teal silhouette of a mountain range is positioned in the bottom right corner of the slide, partially overlapping the bottom edge of the text area.

# Current and background information

- ◆ No baseline CAGN across Carlsbad has ever been collected.
  - ◆ Between 2007-8 about 1,300 to 1,500 acres of suitable habitat surveyed and about 84 pairs and 28 individuals observed, including the golf course.
  - ◆ In 2009, an additional 300-400 acres were surveyed and approximately 10-12 more pairs were found.
- 
- A stylized, dark teal silhouette of a mountain range is positioned in the bottom right corner of the slide, partially overlapping the bottom edge of the text area.

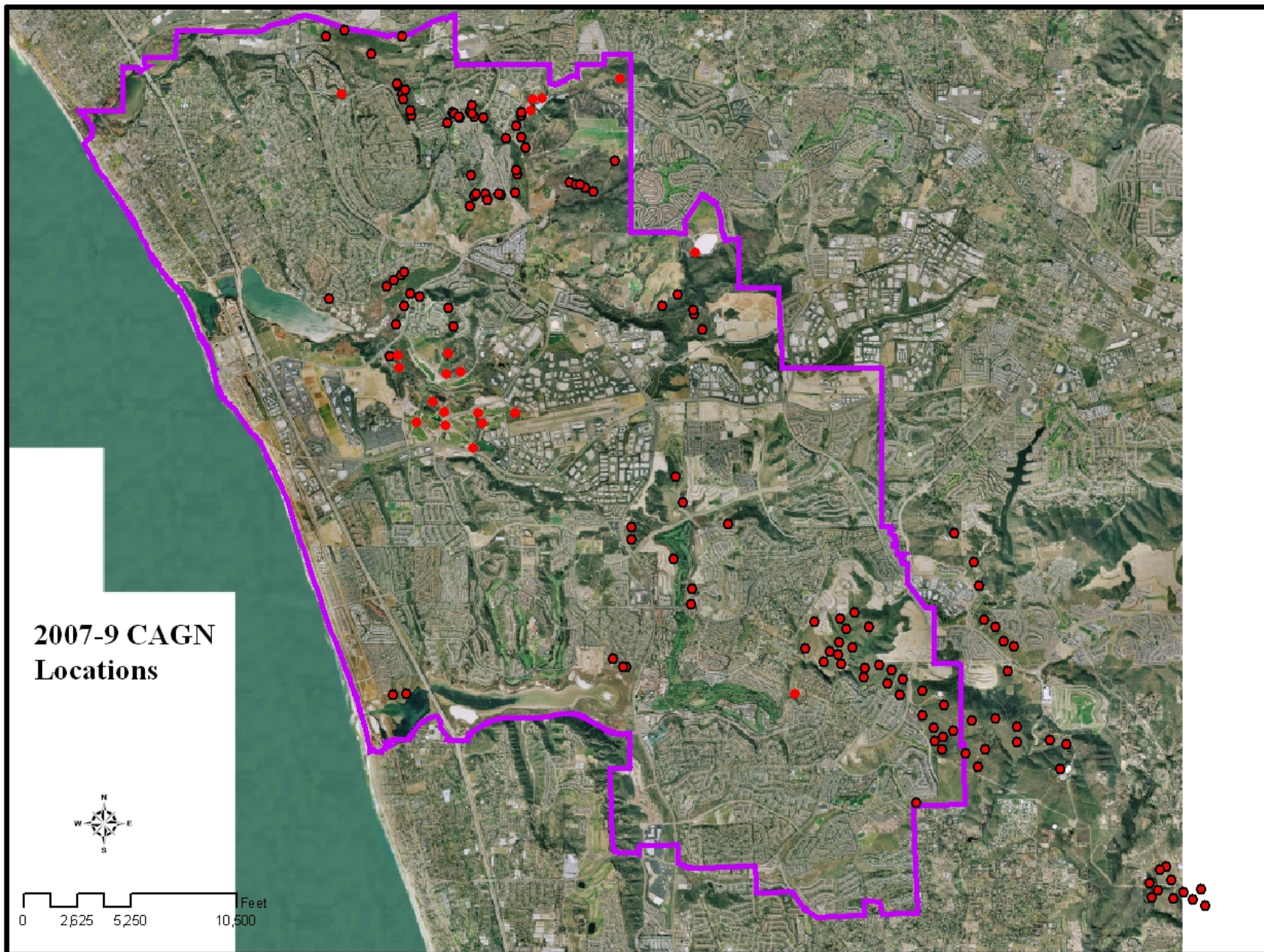




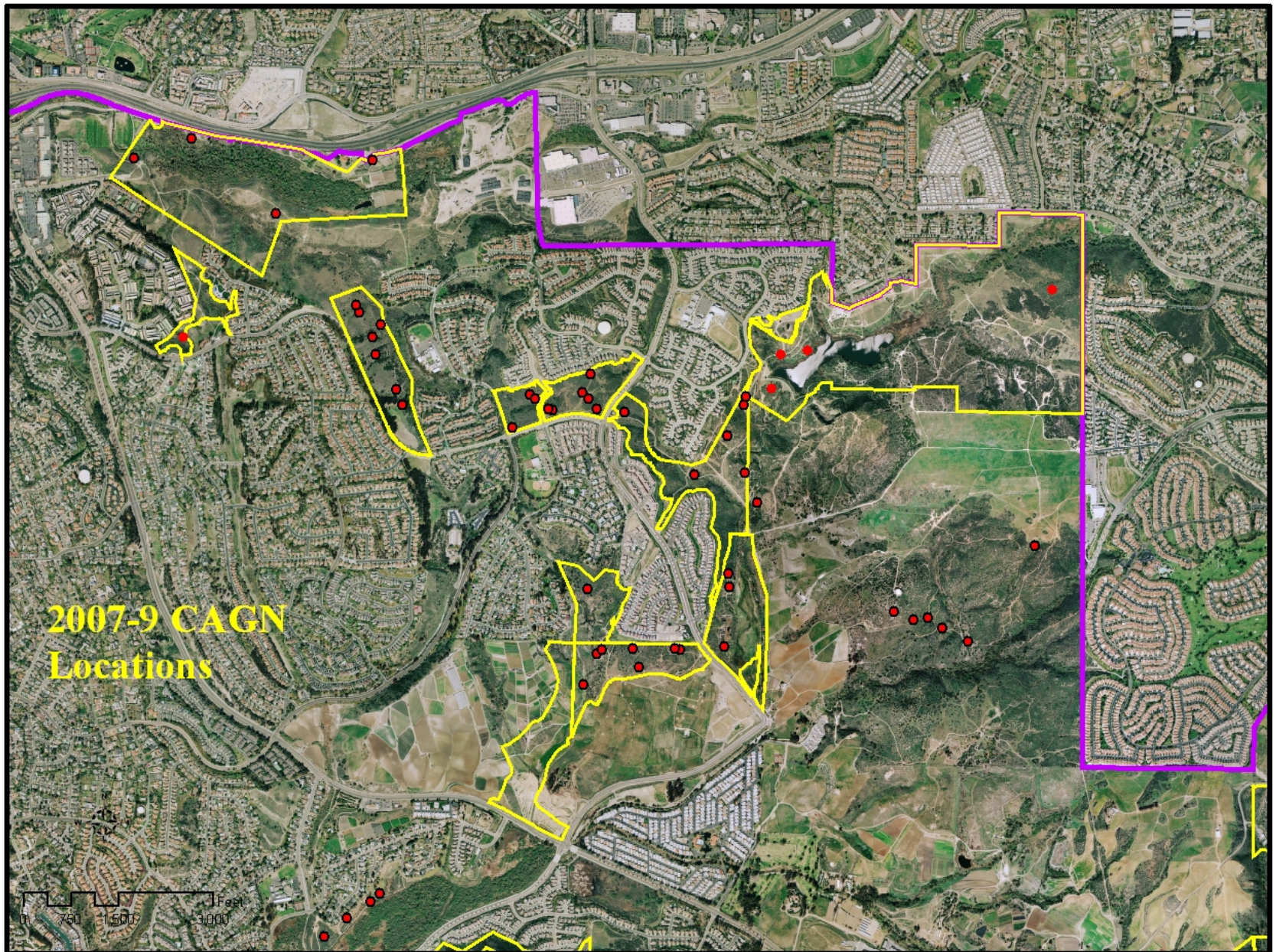
## 2007-9 CAGN Locations



0 2,625 5,250 10,500 Feet



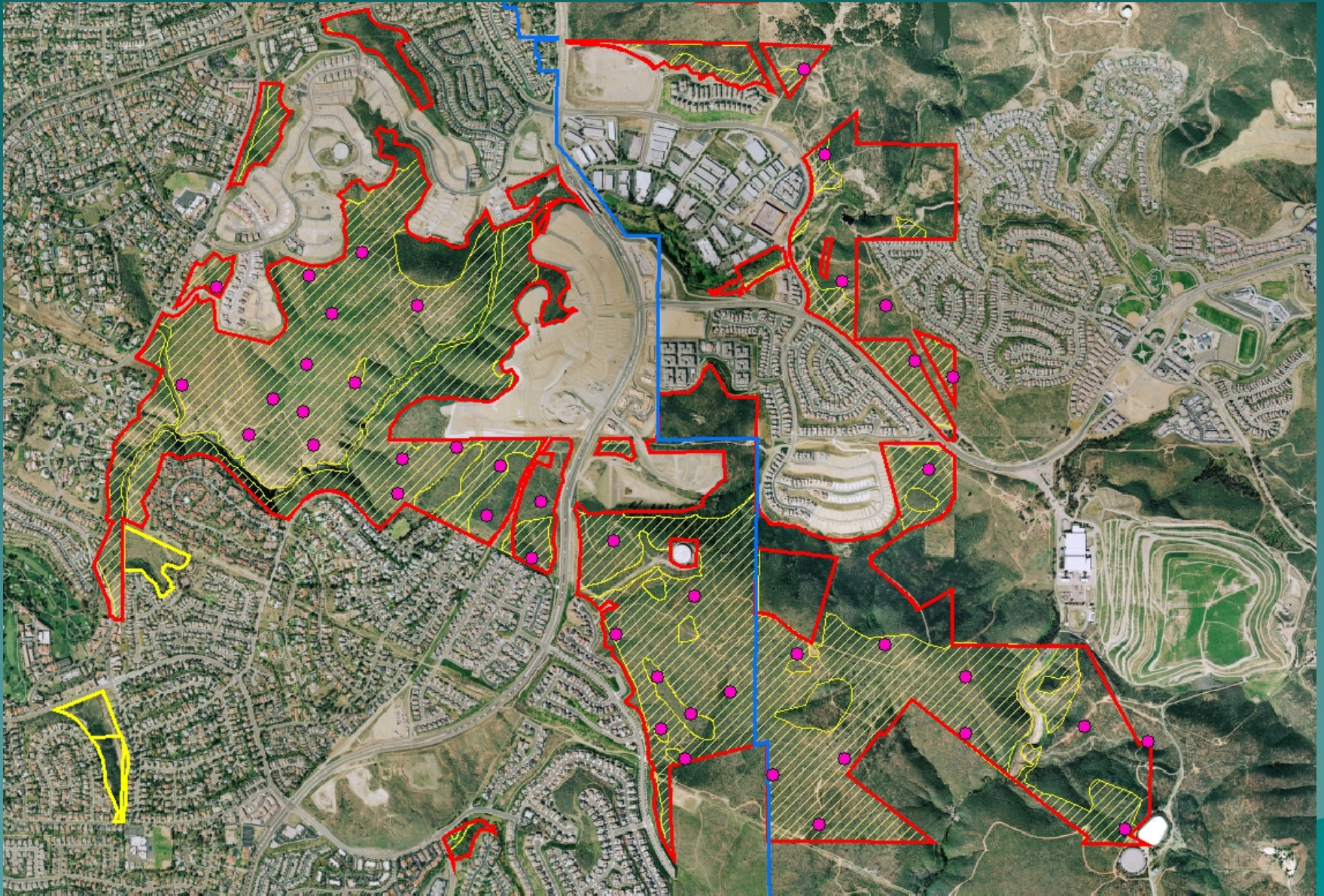








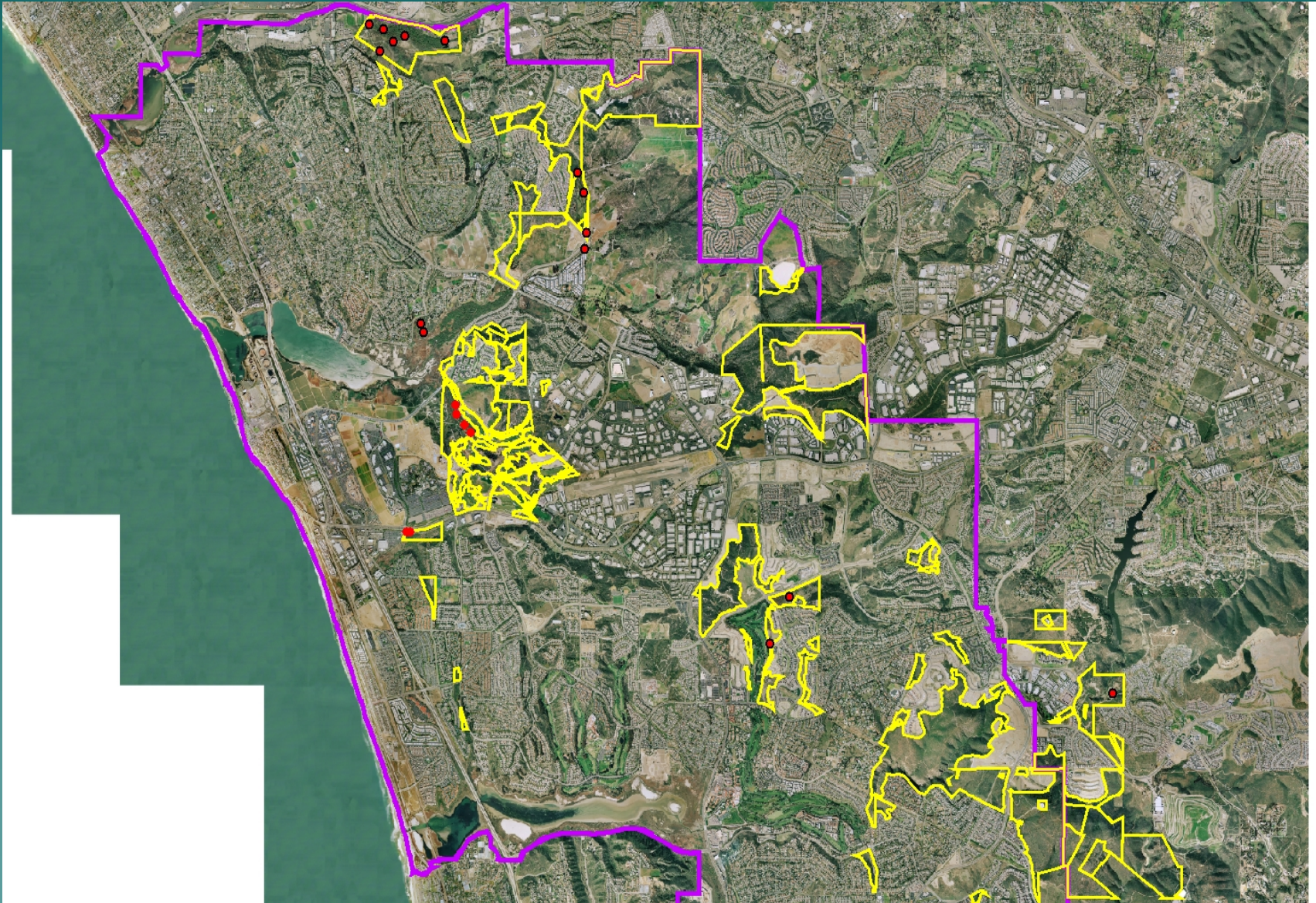




Black-sage dominated



## Least Bell's Vireo



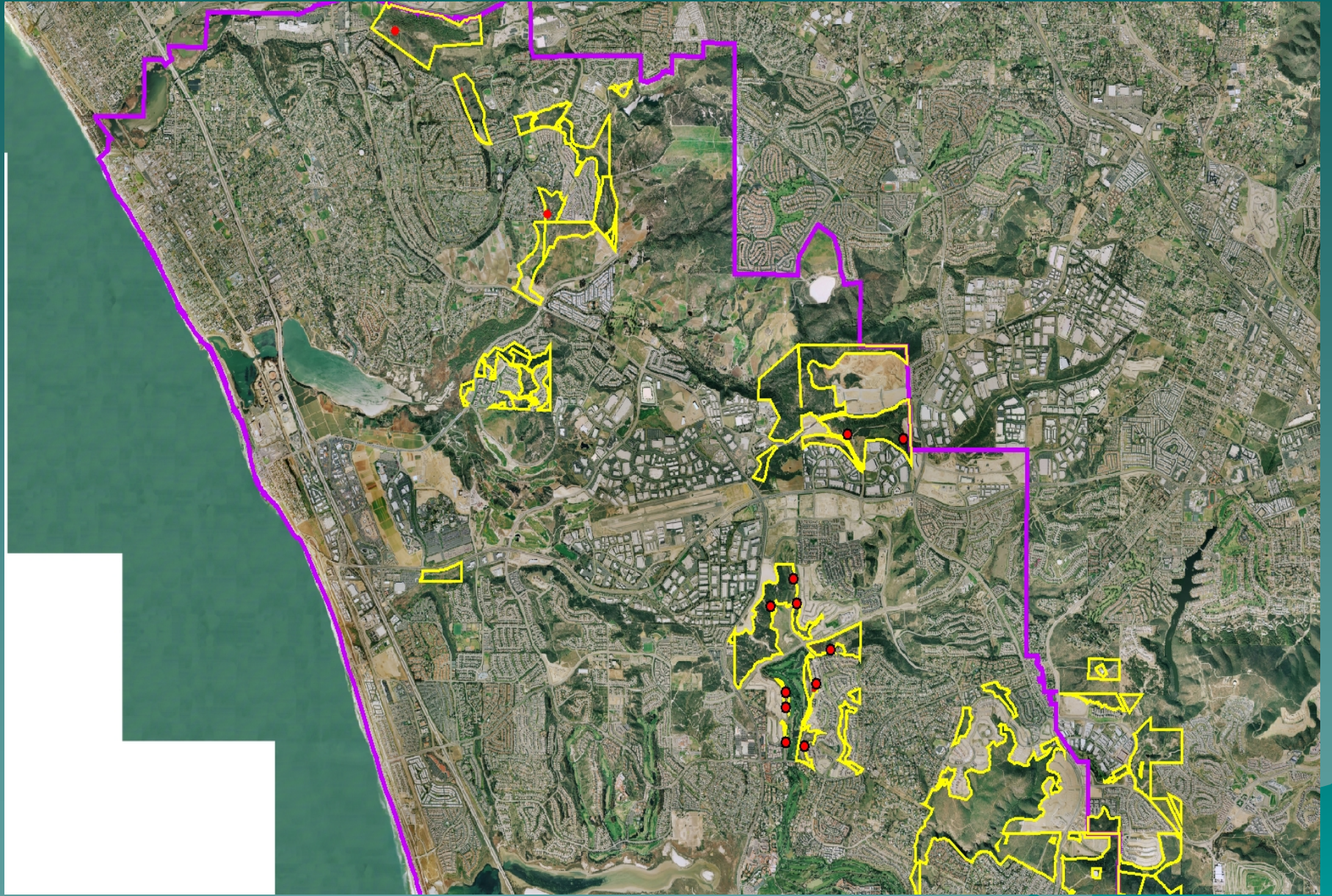


# Thread-leaved brodiaea

## ◆ Goals:

- Monitor trend in population
- Assess habitat quality
- Develop approach to improve habitat quality to protect and enhance the species
  - ◆ Does fusilade have a negative impact on TLB?
  - ◆ Does fusilade or dethatch improve TLB density?
  - ◆ Do nonnative grasses impact TLB?







# Study Method

- ◆ Set up three study plots within which there are 16 subplots.
- ◆ Treatments include fusilade, dethatch, fusilade and dethatch and a control.
- ◆ We've treated in 2007, 2008 and 2009.
- ◆ Measure variables (scape and number of flowers), percent cover of plant species, number of TLB



# TLB Preliminary Study Results


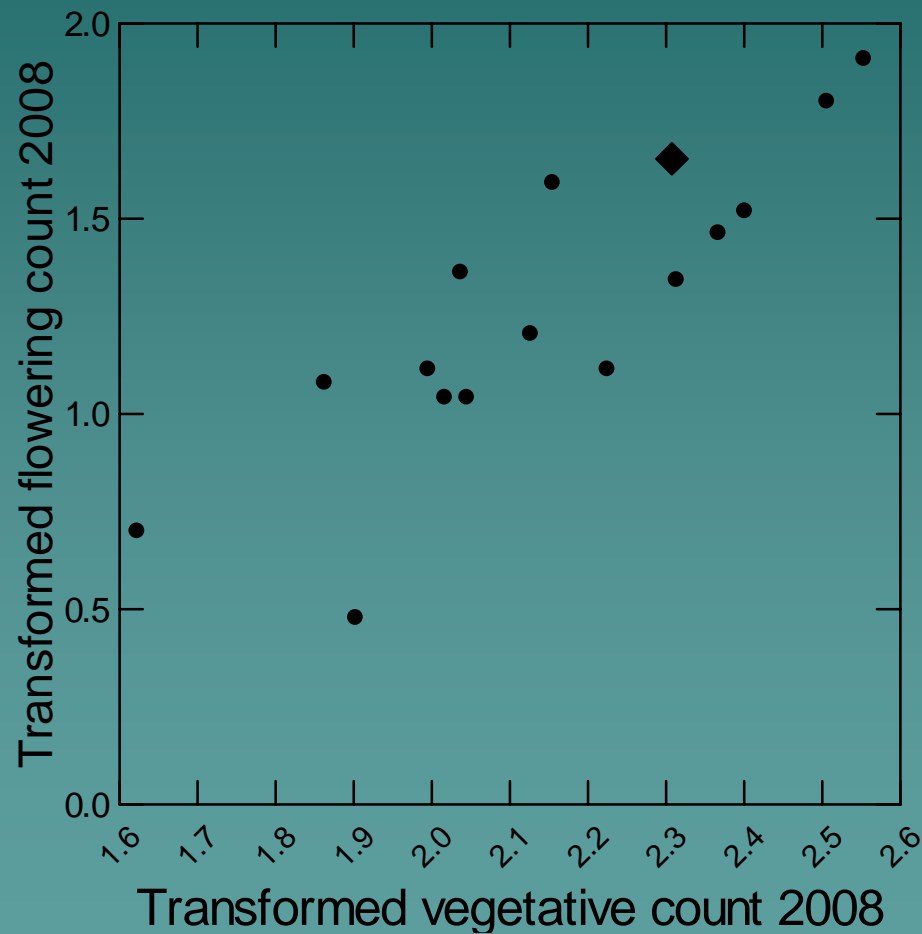
- ◆ Many more TLB protected than originally thought! We estimated that 8,291 flowered in 2008.
  - ◆ But our study revealed that between 2 and 26% flowered in 2008, so there are many more TLB.
  - ◆ We counted close to 30,000 TLB in vegetative state in 2008 in our study plots.
  - ◆ Fusilade has not impacted TLB.
  - ◆ No significant difference in plant characteristics (# of flowers and scape length) observed in the data.
- 
- A stylized, dark teal silhouette of a mountain range is positioned in the bottom right corner of the slide, extending from the right edge towards the center.

Figure 8, scatterplot of flowering counts as a response to vegetative counts in macro-plot 3, measured in winter and spring 2008, respectively. Counts were Log 10 transformed to meet normality assumptions in analyses. Transect 9 counts are represented by the large diamond.













# Coastal Sage Scrub/Fusilade Experiment in East County

## ◆ Goal:

- Reduce cover of nonnative grasses in post fire CSS and within stands of native grasslands/forbs/recovering CSS dominated by nonnative grasses
  - ◆ Two study areas with a total of 12 treatment plots. Two treatments of fusilade at different concentrations and one control.
  - ◆ Also sprayed two acres of nonnative grassland in 2008.
  - ◆ Treated plots in 2007 and 2008. Pre-spray data collection in 2006, with follow up collection in 2007 and 2009.

# Preliminary Results

- ◆ Nonnative grasses (*B. madritensis*) reduced from and average 50% cover (+/- 16%) to 10% (+/- 4%) from 2006 to 2007
- ◆ No impact or significant decrease in any native forbs
- ◆ Primary post fire shrub was deerweed, no impact to this species
- ◆ Additional decrease in Erodium






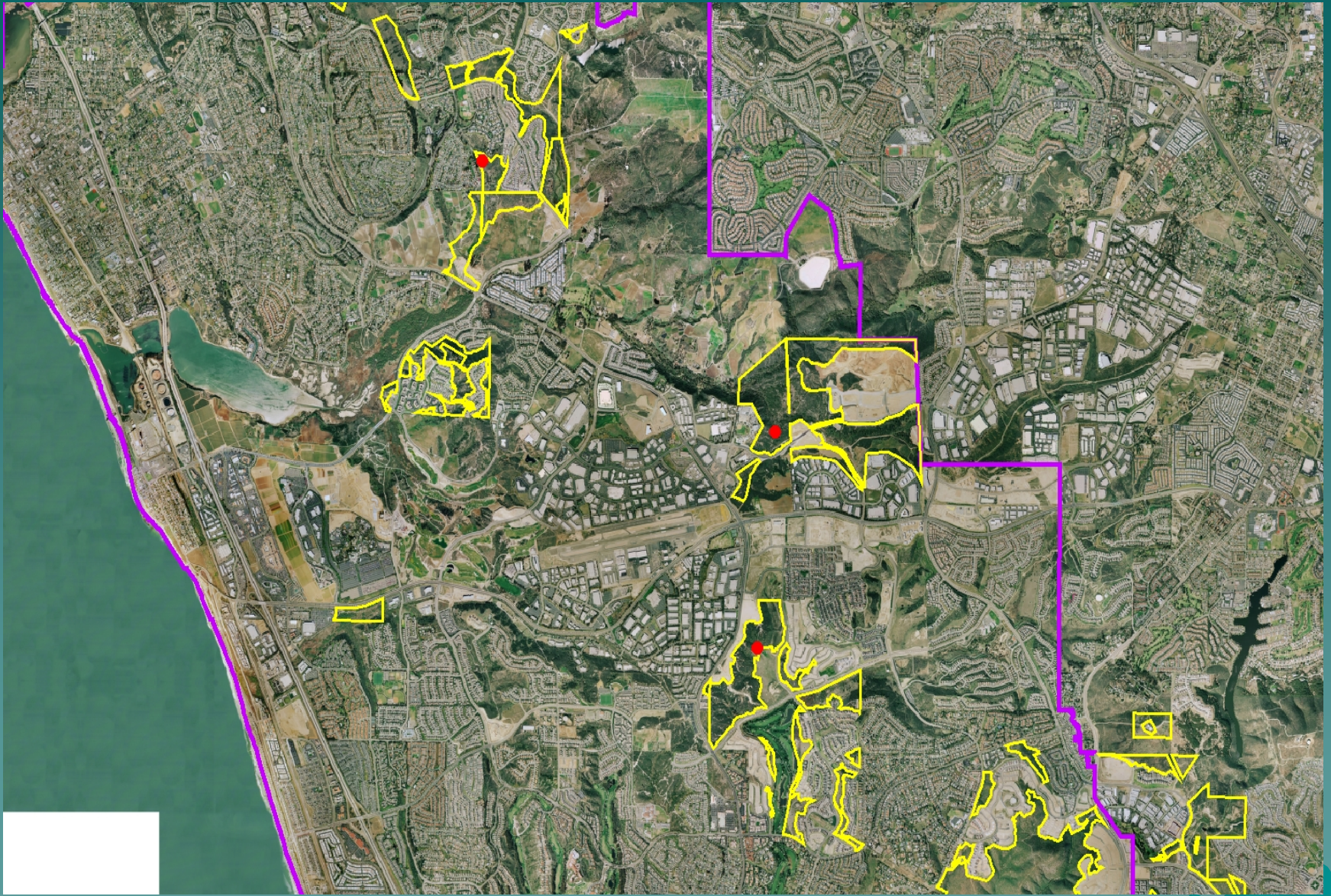




# San Diego Thornmint

- ◆ CNLM found a new locality of SDTM at "Village X" in Calavera Hills (2 individuals in '08 and 4 in '09).
  - ◆ 300 SDTM at La Costa Greens, new locality as of 2003.
  - ◆ 505 in '08 and 556 in '09 at Carlsbad Oaks North
  - ◆ Habitat Evaluations in progress
- 
- A stylized, layered mountain range graphic in shades of teal and blue, located in the bottom right corner of the slide.








|  | Native                          |                                |                             |                              |                             |                        |
|--|---------------------------------|--------------------------------|-----------------------------|------------------------------|-----------------------------|------------------------|
|  | <i>Acanthomintha ilicifolia</i> | <i>Apiastrum angustifolium</i> | <i>Convolvulus simulans</i> | <i>Deinandra fasciculata</i> | <i>Harpagonella palmeri</i> | <i>Plantago erecta</i> |
|  | 2007                            | 0.6%                           | 1.7%                        | 0.0%                         | 1.1%                        | 0.0%                   |
|  | 2008                            | 2.8%                           | 9.3%                        | 2.8%                         | 20.4%                       | 1.9%                   |
|  | Exotic                          |                                |                             |                              | Edaphic                     |                        |
|  | <i>Avena</i> sp.                | <i>Bromus madritensis</i>      | <i>Centaurea melitensis</i> | <i>Sonchus oleraceus</i>     | bare ground                 | litter                 |
|  | 2007                            | 0.0%                           | 0.0%                        | 2.8%                         | 0.0%                        | 73.3%                  |
|  | 2008                            | 1.9%                           | 8.3%                        | 3.7%                         | 1.9%                        | 89.8%                  |
|  |                                 |                                |                             |                              |                             | 26.7%                  |
|  |                                 |                                |                             |                              |                             | 11.1%                  |

# Orcutt's hazardia

- ◆ CNLM introduced 25 OH in 2003 and 100 OH in 2004 at Kelly Ranch.

|                       | 2007 | 2008 |
|-----------------------|------|------|
| # adults              | 104  | 100  |
| # seedlings alive     | 3    | 16   |
| # seedlings dead      | 0    | 5    |
| Total seedlings count | 3    | 21   |

# CSS Habitat Evaluation

- ◆ CNLM commenced its CSS Habitat Evaluation in the spring of 2009.
  - ◆ Study will consist of close to 50 study plots. Approximately 30 were set up and 20 collected from in 2009.
  - ◆ Consists of a large 20 x 50 meter plot with a number of sub-plots. Stratified by a number of variables. Point-intercept along one edge. Data will include cover, richness and diversity.
- 
- A stylized, layered mountain range graphic in shades of teal and blue, located in the bottom right corner of the slide.